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EXAMINER

SYED, FARHAN M

ART UNIT

PAPER NUMBER

2165

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



**DETAILED ACTION**

1. Claims 1-21 and 23-28 are pending. The Examiner acknowledges amended claims 1-10, 21, and 23-28.

***Response to Remarks/Argument***

2. Applicant's request for reconsideration of the finality of the rejection of the last Office action filed on 5/12/09 is persuasive and, therefore, the finality of that action is withdrawn.
3. Applicant's arguments, see page 7, filed 21 May 2009, with respect to claims 1-10, 21, and 23-28 have been fully considered and are persuasive. The Applicant amended claims 1-10 to include a physical device in the method claims to overcome In Re Bilski. The Applicant amended claims 21 and 23-28 to include a processor and memory in the system claims. Therefore, the 35 U.S.C. 101 rejection of an Office Action, mailed 15 January 2009, has been withdrawn.
4. Applicant's arguments filed 12 May 2009 have been fully considered but they are not persuasive for the reasons set forth below.

Applicant argues:

- (1) The cited reference does not teach marking the change data page to indicate that the transaction log buffer has yet to be flushed to a persistent data store.

The Examiner disagrees. Mohan teaches marking the change data page to indicate that the transaction log buffer has yet to be flushed to a persistent data store (i.e. *"Whenever a page is updated and a log record written, the LSN of the log record is placed in the page\_LSN field of the updated page. This tagging of the page with the LSN allows ARIES to precisely track, for restart and media-recovery purposes, the state of the page with respect to logged updates for that page... Periodically during normal processing, ARIES takes checkpoints. The checkpoint log records identify the transactions that are active, their states, and the LSNs of the most recently written log records, and also the modified data that is in the buffer pool"*) The Examiner interprets the LSN field as marking the change data page to indicate the transaction log buffer (i.e. log record) has yet to be flushed to a persistent data store (The Examiner believes that it is inherent that when log records are written that they are written to a persistent data store.)(see at least Sections 3, 5, 6, and 8; specifically page 17).

(2) The cited reference does not teach isolating the transaction by flushing the transaction log buffer to the persistent data store prior to the changed data page being read by a read operation separate from generating the changed data page.

The Examiner disagrees. Mohan teaches isolating the transaction by flushing the transaction log buffer to the persistent data store prior to the changed data page being read by a read operation separate from generating the changed data page (i.e. *"...ARIES(Algorithm for Recovery and Isolation Exploiting Semantics), which supports partial rollbacks of transactions, fine-granularity (e.g. record) locking and recovery using write-ahead logging (WAL)... Periodically during normal processing, ARIES takes checkpoints. The checkpoint log records identify the transactions that are active, their states, and the LSNs of the most recently written log records, and also the modified data that is in the buffer pool. The later information is needed to determine from where the redo pass of restart recovery should begin its processing."*) Figure 5 appears to illustrate the

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aforementioned limitation.)(Abstract; see also sections 3, 5, 6, 7, 10; specifically, see pages 17, 18, and 20).

Hence, the Applicant's arguments do not distinguish over the claimed invention over the prior art of record.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-21 and 23-28 are rejected under 35 U.S.C. 102(b) as being anticipated by a non-patent literature titled "ARIES: A Transaction Recovery Method Supporting Fine-Granularity Locking and Partial Rollbacks Using Write-Ahead Logging." by C. Mohan et al., ACM Transactions on Database Systems, vol. 17, no. 1, March 1992, pages 94-162 (known hereinafter as Mohan).

As per claims 1, 11, and 21, Mohan teaches a method for reading a changed data page, said method comprising of: generating the changed data page in response to a change to the data page as a result of a transaction (i.e. *"ARIES also logs, using compensation log records (CLRs)...CLRs have the property that they are redo-only log records."*)(Sections 3, 5, and 6); storing data associated with the change in a transaction log

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buffer (i.e. *"ARIES keeps track of changes made to the database by using a log and it does write-ahead logging (WAL)."*)(Section 3; see also Sections 4 and 5); marking the changed data page to indicate that the transaction log buffer has yet to be flushed to a persistent data store (i.e. *"Whenever a page is updated and a log record written, the LSN of the log record is placed in the page\_LSN field of the updated page. This tagging of the page with the LSN allows ARIES to precisely track, for restart and media-recovery purposes, the state of the page with respect to logged updates for that page"*)(see at least Sections 3, 5, 6, and 8); determining whether the changed data page is marked (see at least Sections 3, 5, 6, and 8); and isolating the transaction by flushing the transaction log buffer to the persistent data store prior to the changed data page being read by a read operation separate from generating the changed data page (i.e. *"...ARIES(Algorithm for Recovery and Isolation Exploiting Semantics), which supports partial rollbacks of transactions, fine-granularity (e.g. record) locking and recovery using write-ahead logging (WAL)"*)(Abstract; see also sections 3, 5, 6, 7, 10).

As per claims 2 and 12, Lomet teaches a method further comprising: unmarking the changed data page when the transaction log buffer is flushed (Abstract; see also sections 2, 3, 5, 6, 7).

As per claims 3, 13, and 23, Lomet teaches a method wherein flushing the transaction log buffer occurs when the changed data page is marked (Abstract; see also sections 2, 3, 5, 6, 7).

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As per claims 4, 14, and 24 Lomet teaches a method wherein marking the changed data page comprises writing a value of a bit associated with said changed data page (Abstract; see also sections 3, 5, 6, 7, 10)

As per claims 5, 15, and 25, Lomet teaches a method wherein the bit is stored in said changed data page (Abstract; see also sections 3, 5, 6, 7)

As per claims 6, 16, and 26, Lomet teaches a method wherein the bit is stored in a reference table (Abstract; see also sections 3, 5, 6, 7, 10)

As per claims 7, 17, and 27, Lomet teaches a method wherein marking the changed data page comprises recording, in a reference location associated with said changed data page (Abstract; see also sections 3, 5, 6, 7), a copy of a log sequence number from said transaction log buffer and corresponding to the change to the data page (Abstract; see also sections 2, 3, 5, 6, 7).

As per claims 8 and 18, Lomet teaches a method wherein said copy of the log sequence number is stored in said changed data page (Abstract; see also sections 3, 5, 6, 7, 10).

As per claims 9 and 19, Lomet teaches a method wherein said copy of the log sequence number is stored in a reference table (Abstract; see also sections 3, 5, 6, 7, 10)

As per claims 10, 20, and 28, Lomet teaches a method wherein the copy of the log sequence number is used to identify a transaction in order to cause said transaction to effect the flushing of the transaction log buffer (Abstract; see also sections 3, 5, 6, 7, 10).

### ***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Farhan M. Syed whose telephone number is 571-272-7191. The examiner can normally be reached on 8:30AM-5:00 PM.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Neveen Abel-Jalil can be reached on 571-272-4094. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/F. M. S./  
Examiner, Art Unit 2165

/Naveen Abel-Jalil/  
Supervisory Patent Examiner, Art Unit 2165